

From Lean Manufacturing to Lean Supply Chain: A Foundation for Change

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Lawson

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Executive Summary

As apparel and textile companies move to outsourcing production—relinquishing direct control in favor of a more cost-effective manufacturing model—a lean supply chain may appear to be the next logical step for further implementing cost and operational improvement. Not so, however. You can't have a lean supply chain without lean manufacturing. Regardless of whether you or your partners engage in production, lean manufacturing is the engine that drives lean supply chain efficiencies.

In today's marketplace, trading partners prosper by supporting supply chain ecosystems. These are demand-driven sourcing and procurement relationships that encompass raw materials, manufacturing, finished products, distribution, and a range of automated communication technologies, with forecast and process data accessible to all participants. The fashion industry is a prime example.

Nature runs lean, driven by survival. This is the main reason that a natural ecosystem can maintain itself in the face of external stresses and ever-changing environmental conditions. Accordingly, the business requirement for stability in a constantly changing demand environment motivates the fashion industry's search for lean supply chain management principles and practices.

Customer Spotlight:

Avi Pinhas

IT Director, Delta Galil

Private-label manufacturer

Headquarters in Israel with design, development and manufacturing centers on four continents

Pinhas is overseeing the implementation of a technology infrastructure that will put Delta Galil at the commercial forefront of its industry. Central to this is a collaborative supply chain that he and his 40-strong team is creating to link suppliers, Delta's sourcing, marketing and manufacturing facilities, and customers together in what he describes as "a virtual relationship where there are no barriers to achieving the impossible".

Working closely with Pinhas is Delta Galil's technology partner, Intenia (now Lawson), a global provider of enterprise solutions. Intenia (now Lawson) is implementing its collaborative Lawson Fashion solution to create the foundation on which Delta Galil is building what it believes will be a truly collaborative trading environment. Some subcontractors have already become "virtual factories" because they report directly into the Lawson solution.

Pinhas has no illusions about the magnitude of the task. "We employ 13,000 people; have 40 factories in 11 countries, and more than 1,000 suppliers. Each month we produce ten million pieces, each one containing an average of ten items. The production of each piece can involve movement through five different factories, crossing three borders, before it reaches our goods warehouse for onward shipment to a customer's distribution center. Our supply chain is particularly complex and militates against us maintaining high -service levels."

He continues, "That's why, alongside our enterprise application, we've also started a supply chain planning (SCP) project with Intenia (now Lawson). The project will connect suppliers to our business-to-business (B2B) system and create demand visibility. This will give us the opportunity to focus on two important key performance indicators: lead times and transaction costs. Issuing a purchase order currently costs us between USD 172 and USD 275. We think we can get this down to USD 70."

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What Is Lean Manufacturing?

Lean manufacturing is a philosophy pioneered by Toyota Motors (and codified by James P. Womak's *The Machine that Changed the World: The Story of Lean Production*), based on the planned elimination of all waste, the continuous improvement of productivity, and an ongoing focus on customer value. Waste—Muda in Japanese—refers to the consumption of resources, including time, on activities that do not add value for the customer. Resource-wasting activities may occur at any point in a manufacturing or distribution process—in design, production, supplier management, order handling, distribution or customer service.

The lean philosophy seeks to reduce waste anywhere in the company, optimize core resources and establish a corporate culture dedicated to identifying and continuously fostering customer satisfaction. Its five core principles guide the elimination of waste and the simplification of all manufacturing and support processes:

- Production of value
- Optimizing the value stream
- Converting batch-based process to flow
- Activating the demand pull
- Perfection of all products, processes and services.

Each of these principles is the starting point for the creation of a lean supply ecosystem, beginning within the production environment

Principle 1: Production of Value

Value is determined from the perspective of the customer, whether it be lowest cost, best delivery performance, highest quality, a unique solution to product/service requirements, or some combination of these requirements. Whatever the definition, the value proposition is expressed as a product or service required at a specific price and time. Production to this specification is value creation.

The lean manufacturer focuses on improving product performance and quality while reducing costs. Lean manufacturing often requires companies to reshape their processes, performance and the financial metrics that make up management scorecards. It is a mistake to see lean solely as a cost-cutting strategy. The fundamental priority is finding better ways to deliver value to the customer.

Principle 2: Optimizing the Value Stream

The value stream includes all activities required along the value fulfillment path, from product design to customer delivery. Optimizing it is the task of product management. The goal is to identify the integral component processes necessary to value generation. Value stream mapping is the requisite tool here. The first map should be a visual representation of the current state of production processes everywhere in the organization, from accounts payable to the shop floor. It can help all participants (management, engineers, production workers, schedulers, suppliers and customers) to recognize waste and identify its causes. A second “future state” map will help guide improvements.

This step—mapping the manufacturing value stream—marks the true beginning of the lean supply chain because it moves beyond the walls of the manufacturing company to include the supplier and customer. The producer should look primarily for supply chain partners who create value-added alliances rather than those who offer price concessions alone. Value-added alliances need to be validated by performance measures transparent to all participants.

Principle 3: Converting the Process to Flow

The flow principle underlies lean operations management. Once waste is removed, the goal is to transform all steps involved in making products (both within and outside of the organization) from lot-size production to flow; that is, continuous small-lot production. Continuous small-lot runs transform batch-queue thinking, department boundaries, and the batch planning and costing paradigms with their efficiency performance measurements that serve to impede flow. Lean accounting and performance measurement practices must replace obsolete batch production management practices.

Principle 4: Activating the Demand Pull

The ability to design, schedule, build and deliver to customer demand pulls product through the production process and supply chain. Demand-based manufacturing achieves the most stable and efficient workflow without the inevitable guesswork and imprecision of forecasting, costly price/discounting campaigns, and excess inventory caused by the “bullwhip effect”. Demand pull production also dramatically diminishes all forms of processing lead time.

Finally, activating demand pull means discontinuing the use of forecasts for planning and production execution. This may seem like a radical risk or even impossibility to many companies whose present supply chain practices are forecast based. In fact, it brings more reward than risk. Like any departure from prior operating procedures, the transition will take time, practice and cooperation within the supplier ecosystem.

Principle 5: Perfection of All Products, Processes and Services

When the first four principles are in place, companies are prepared to implement perfection of all processes, products and services. Momentum feeds this significant cultural change. A pull-based supply chain exposes waste and barriers in the flow. When these are resolved, more value and more new avenues to create customer value present themselves in what becomes a perpetual improvement cycle. Lean technologies and processes may represent a radical change in operations and corporate culture, but they are easier to implement than one might think. Pull simplifies processes and creates transparency where all supply chain partners can participate interactively in enhancing value.

What Is Supply Chain Management?

The concept of supply chain management (SCM) is perhaps the most critical management concept and practice shaping today’s business environment. According to the Council of Supply Chain Management Professionals (CSCMP), SCM can be defined as encompassing “the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities ... It also includes coordination and collaboration with channel partners, who can be suppliers, intermediaries, third-party service providers and customers. In essence, supply chain management integrates supply and demand management within and across companies.”

It has long been recognized that SCM originated with the logistics function. Over the past half century, logistics has evolved from a purely operational subset of inventory and sales management to become a fundamental strategic component of today’s leading manufacturing and distribution companies. The SCM concept has evolved with it through the five distinct stages shown in figure 1 below.

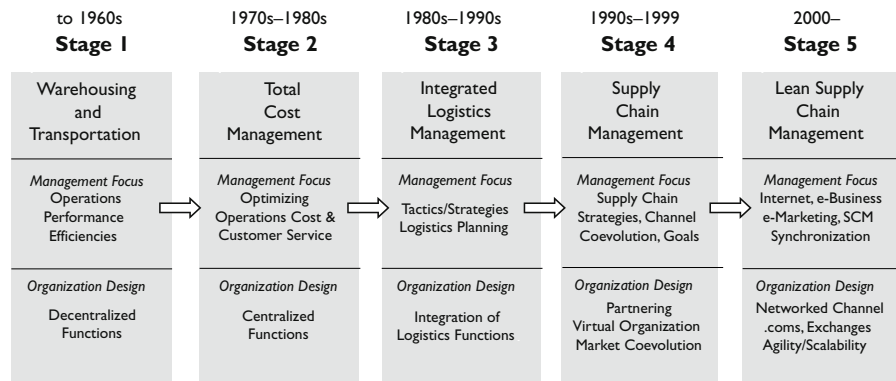


Figure 1: Five Stages of Supply Chain Management

Stage 1 is the era of logistics decentralization. In Stage 2, logistics began the evolution from functional decentralization to organizational centralization driven by new attitudes associated with cost optimization and customer service. Stage 3 represents the dramatic expansion of logistics from a narrow concern with internal cost management to new concepts calling for the linkage of internal operations with analogous functions performed by trading partners. As the concept of trading partner collaboration grew, the old logistics model gave way in Stage 4 to full-blown SCM. Today, the application of lean concepts to closely integrated trading-partner networks is driving Stage 5, lean SCM.

Implementing lean SCM requires a radical evolutionary step in network process and design, requiring companies to pass through three stages:

First, integration of supply chain functions within the enterprise. For example, linking warehousing and transportation processes to an ERP backbone increases visibility of delivery, cost and other execution activities for the entire customer and supplier order process.

Next, integration and synchronization of inbound and outbound order management activities with trading partners. In this step companies must be willing to share important information with immediate trading partners. Normally this information is restricted to tactical functions and is focused on short-term cost savings, operational efficiencies and customer service.

Finally, utilizing Internet connectivity to synchronize the network of supplier relationships into a single, scaleable “virtual” enterprise. The resulting network organization is capable of tremendous flexibility and responsiveness; it enables optimization of core competencies and resources from anywhere at any time in the supply chain to enhance business processes and strategic development, and to optimize each component of the value network.

Don't be misled by the dates attached to the five SCM stages detailed above. They refer to the introduction of ideas that redefined SCM “state of the art.” In practice, most companies and their supply chains have still not moved much beyond Stage 3 or even Stage 2 logistics, five years into the 21st century. However, these dates aren't all theoretical either. In the first paper of this series, we offered two benchmarks for Stage 5 logistics.

The first benchmarked company, the retailer Zara, belongs to the Inditex holding company that controls virtually all of the supply chain for Zara. The second company, the contract manufacturer TAL Apparel Limited (The TAP Group), is in Stage 5 for

some of their operations, and aggressively moving toward it in others. Their supply chain partners are independents, so the rate at which TAL's entire operations reach Stage 5 will depend in part on other members of their ecosystem. Nonetheless, moving toward that goal confers a significant competitive advantage.

What Is Lean Supply Chain Management?

Lean SCM is a supply chain operational and strategic management philosophy that utilizes Internet-enabling technologies to effect the continuous regeneration of supplier and service partner networks. A lean supply chain network is empowered to execute superlative, unique customer-winning value at the lowest cost through the collaborative, real-time synchronization of product/service transfer, demand priorities, vital marketplace information and logistics delivery capabilities.

The critical components of this definition are revealing. To begin with, Internet-enabled supply chain operational and strategic management philosophy defines the scope of lean SCM. The continuous regeneration of networks of supply channel partners concept implies that companies succeed in the 21st century by generating constantly evolving networks of supply chain partners. Such continuously evolving networks can respond to the dynamic nature of today's ongoing demand for new forms of customer/supplier collaboration and scalable product and information delivery flows. Today's companies compete by the quality of their supply chains.

Unique customer-winning value refers to the ability of companies to assemble agile, scalable production/distribution systems capable of continuously reinventing unique product and service configurations and value-creating relationships. This element defines the mission of all trading partners. And finally, collaborative, real-time synchronization refers to the application of technology process enablers that network internal enterprise systems, decision support tools and data warehouses to merge, optimize and effectively direct supply chain competencies. This element describes the mechanics of how Internet-enabled supply chains compete.

Figure 2 provides a simplified view of the lean supply chain concept described above. The supply network in the foreground (green) is one node of a much larger supply chain ecosystem. The background nodes would also have many simultaneous processes occurring both internally and between nodes.

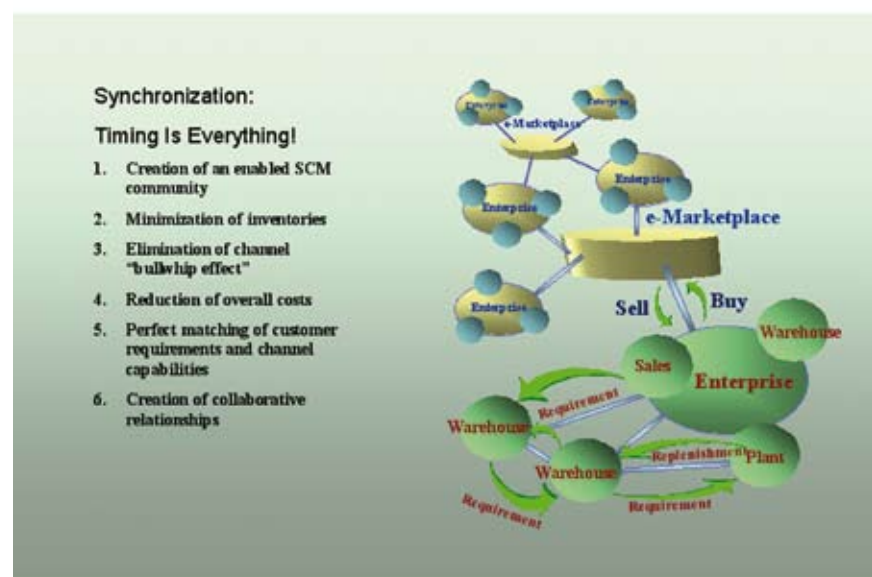


Figure 2: Supply Chain Ecosystem

We began by describing the five pillars of lean manufacturing (see page 3). Those principles primarily concern the pursuit of lean objectives within the enterprise. Lean supply chain management is grounded in these principles, but focuses on the most effective management of supply chain ecosystems. In today's extremely competitive environment, global sourcing has vastly expanded the number of potential players. Consequently excellent logistics execution is more important than ever—supply chain ecosystems must quickly eliminate nodes that are unproductive. At the same time, they must stabilize themselves by ensuring that proven partners survive and prosper:

To succeed and lead, the entire supply chain ecosystem must continuously adapt and adopt the following six mechanisms:

- e-Information—Information accumulated, tracked, monitored and harnessed over the Internet
- Supply chain synchronization
- Supply chain collaboration
- Optimization
- Operations excellence
- Connectivity and networking.

Mechanism #1: e-Information

If the prime driver of SCM is information, then the faster information can be gathered, analyzed and diffused through the channel network, the more competitive supply chain trading partners will be. Internet technology provides the means to make real-time demand management, manufacturing, logistics and storage data visible

Customer Spotlight:

***Delta Galil* (continued from page 3)**

Pinhas adds that Delta Galil is also implementing Intenia's (now Lawson) corporate portal, which will provide Delta Galil with a single view of the entire company, "regardless of the type of system at each local venue". The corporate portal will enable Delta Galil to make big strides forward in consolidating information, particularly stock and sales data. This information will be captured and analyzed by a new data warehouse and business intelligence system.

He explains, "We will be able to analyze daily sales from around the world by currency, supplier, customer, product and best sellers, and to present the report to the management team first thing the following morning. This means we can see what's going on in the business and throughout the supply chain almost at a moment's notice, stay right on top of what our customers want, and make better informed decisions more quickly."

Not content with this, the company is also implementing XML open technology to give it the flexibility to integrate with other systems, such as the industry's leading marketplace, www.retailexchange.com. "When a buyer posts a procurement request in the marketplace, it will be received automatically in Intenia's (now Lawson) enterprise application where a quote will be created," says Pinhas. "And when a purchase order has been received, the enterprise application will automatically create a manufacturing order. It's going to improve our efficiency enormously and give us access to further business opportunities.

"We've set ourselves the task of using technology to achieve some important KPIs that, in turn, will help us improve the way we run our business, produce a tangible return on investment, and improve customer service to new, higher levels.

"We've already made a small start, for example, by improving the accuracy of orders from 97 percent to in excess of 99.6 percent. But we've got a lot more work to do. The key for us is to stay ahead of our customers so that we are always in a position to anticipate their needs and give them what they want the first time, every time."

to all trading partners. Internet-enabled data enables trading partners to integrate supply chain interactive processes such as vendor-managed inventory. These trading-partner transactions can be broken down into five areas:

Customer e-intelligence. Lean SCM's first challenge is to understand and respond effectively to customer needs and requirements. Partners need to:

Gather and share demand management intelligence regarding the validity of forecasts, the impact of out-of-bounds events, and actual product/service mix usage occurring at any point in the channel. All too often companies are planning based on the demand generated by orders for delivery to stores. Weeks later they find that some styles have not been selling and have to be marked down and others sold out early in the season. Getting timely information about actual consumer sales electronically from the point-of-sale systems enables companies to truly move towards a demand-driven environment.

Unearth data regarding the impact of pricing and promotion decisions governing channel fulfillment. Tools in this area need to provide intelligence as to the velocity of sales and the timely reporting of revenues, costs and profits.

Detail the status of channel inventories, optimize the trade-off between capacity utilization and customer service, and enable replenishment visibility and rapid redeployment of channel inventories.

Logistics e-information. Demand intelligence linked with logistics data can determine the optimal use of transportation and warehouse resources to maximize customer fulfillment value. Supply chain partners need visibility on internal and external logistics functions so that they can allocate resources to best meet a specific demand flow. Logistics planners likewise need accessible real-time intelligence in order to configure unique value networks. To be successful, planners will require Web-based applications that enable cross-channel system interoperability to provide insight into the status and velocity of production capacities, storage capabilities, inventory availability and replenishment processes, and transportation resources at each node in the supply network.

Channel network resource alignment e-information. Cost-efficient SCM requires timely intelligence as to the positioning and planned allocation of products and services as they exist in the network at any given time. The optimal allocation of demand-satisfying resources requires knowing the total cost of customer service throughout the demand chain. Tools such as activity-based costing, the balanced scorecard, or the supply chain operations reference model (SCOR) graphically identify pools of costs residing at the points where trading partner processes intersect. These tools/models must be capable of determining such critical fulfillment values as reliability, responsiveness, flexibility, cost and efficiency of asset utilization, and be able to communicate the metrics in real-time to other channel constituents.

Product and process e-information. Companies have turned to the Internet for assistance in three major production-related areas:

Web-based tool sets to execute product design content synchronization. Today's design teams are linked together by real-time concurrent peer-to-peer (P2P) technologies that create interoperable knowledge repositories linking CAE/CAM systems, product data management (PDM) systems, direct customer configuration feeds and design collaboration software (DCS).

Online trading communities that facilitate product and supplier search, order status and tracking, product catalogs, and buyer/supplier back-end integration.

The application of cross-channel advanced planning and scheduling (APS) systems.

e-Procurement information. Working with suppliers today requires two types of information: intelligence about collaborative relationships and projects, and intelligence about supplier capabilities. Both are focused on a single objective: to reduce supply chain risk. While many companies in the past attempted to utilize EDI or merge ERP output, the results were inward facing. They did little to further the integration and collaborative relationships necessary to enhance the speed of transfer and depth of information that sales and manufacturing management need.

Internet-based technologies are rapidly making this supplier intelligence gap disappear. Today's cutting-edge companies can assemble a complete picture of their supply relationships. They leverage Web technologies such as e_RFPs, auctions, trading exchanges, logistics interfaces, automated shopping applications, and Web-enabled services such as strategic sourcing, fulfillment, collaborative design, and finance and billing.

Mechanism #2: Supply Chain Synchronization

The real challenge is to present real-time information concurrently so that all supply chain partners can receive and utilize it at the same time. The benefits are obvious. Synchronization of demand/supply information minimizes work-in-process and finished goods inventories up and down the channel, dampens the "bullwhip effect" as products are pulled through the distribution pipeline, reduces costs overall, and matches customer requirements with available products.

To be of value, supply chain synchronization requires all members of the ecosystem to engage in partnerships that collectively optimize resources and reduce costs. A synchronized supply chain will consist of the following key components: a unified business strategy, common measurements for product and performance excellence, and the selection of enabling technologies.

Unified business strategy. No company today possesses all the strengths needed to remain competitive by itself. As such, the creation of business strategies rightfully extends beyond a company's boundaries and should be folded within an interchannel effort. Such efforts result in the formulation of joint strategies that foster the use of optimal, cost-effective methods of designing, building and delivering unique, customer-winning value to the marketplace by leveraging the capabilities of the entire supply chain.

Common measurements. Effective supply chain synchronization requires that all trading partners collectively achieve operations excellence. This requires more effort than simply establishing electronic transactions or sharing forecasts. It requires synchronizing the performance of each channel member and blending the performance measurements into a total supply chain balanced scorecard. Expect the Supply Chain Council's Supply Chain Operations Reference (SCOR) to keep gaining popularity for this purpose. The SCOR model includes a cross-functional framework, standard terminology, common metrics and best practices that can be applied to entire supply chains.

Selection of enabling technologies. To synchronize the channel, trading partners must synchronize their internal business systems. Web-based applications are beginning to give participating partners access to the applications and objectives of each supply network node. The goal for the future is development of interoperable process components that enable whole supply chains to access selected data from the databases and processes of member ERP backbones and front- and back-end applications such as CRM, HTML/XML document integration, data warehouses and various trading exchanges.

Mechanism #3 Supply Chain Collaboration

Perhaps the most critical component of lean SCM is the willingness of channel members to engage in and constantly enhance collaborative relationships. Many companies have come to realize that short-term benefits brought about by logistics optimization and technology automation are incapable of producing the radical competitive breakthroughs that can be attained when channel partners strive to build long-term collaborative relationships.

As a supply network, the dominant characteristics of lean SCM are collaboration and synchronization. Collaboration is essentially the ability to share and interact upon critical data. Synchronization means possessing the channel intelligence to access the right product and the right service in the supply chain to satisfy the customer. Lean SCM is not just about employing Internet-enabled information and synchronization tools. It demands that companies up and down the supply chain embrace the accompanying cultural and organizational changes as well.

Collaboration occurs in increasing intensity within both the technical and business spheres. Technical collaboration ramps up from fax to EDI, server-to-server links and Internet applications providing real-time information and transaction synchronization. Business collaboration ramps up from a bare minimum to joint operations, coordination of network partner competencies and joint visioning where partners cooperate and compete as if they were a single channel entity.

Each level of collaboration generates value through four critical drivers:

- The collaborative capacity of intracompany management teams grows in proportion to the level of collaboration intensity.
- As collaborative intensity grows it drives exponential growth in more complex technical and business infrastructures to create and extract value.
- While joint business processes within the channel are critical for creating collaborative value, they are just the start of many possibilities.
- Strategic planners must constantly search for and implement new technologies and management methods.

While no one can disagree on the power of collaboration, there are many barriers that inhibit implementation. Corporate inertia and internal performance silos often pose an almost insurmountable barrier to building an environment that encourages openness, communication and mutual dependence. Another barrier is lack of trust. Companies fear that proprietary information will be broadcast to partners who will in turn pass it on to competitors or use it to unfair advantage. The best collaborative relationships typically take years of good will, investment in resources and proof of mutual benefit.

In addition, collaboration has often been confused with process reengineering. While collaboration will increase efficiencies, such a short-term understanding misses the real advantages. They are found in the leveraging of channel competencies, utilization of cross-channel best practices and innovation. Last but not least, the incompatibility of trading partners' system platforms poses a serious deterrent to shared communications.

Mechanism #4 Optimization

A supply chain ecosystem must be capable of utilizing process management and technology tools to continuously optimize productive resources. Optimization requires the pursuit and merger of three levels of improvement. First is the lean principle discussed earlier—a focus on eliminating waste and engineering “perfect” processes on the company level. It aims to reduce costs while at the same time providing for the establishment of new sources of customer value.

Second is the pursuit of optimization across trading partner relationships and systems. This initiative is much harder to accomplish. Channel nodes must closely collaborate, synchronize and integrate processes. The goal is to bring about value chain-wide processes that promote cost savings, efficiencies and productivities that make the entire supply chain ecosystem more competitive.

Finally, lean SCM optimization requires the standardization and rationalization of all supply channel processes. In detail, this effort seeks to remove the impediments caused by batch and queue thinking within separate operations. In general, this principle assists partners in removing the same barriers in the supply chain and integrating the design, production and transfer of goods and information. It also helps ensure that customer-satisfying efforts are centered in the most efficient points in the supply network.

Mechanism #5: Operations Excellence

The foundation for effective lean SCM lies in the ability of entire supply chain networks to achieve superlative levels of collaborative operations excellence. The SCM standard of excellence requires trading partners to coordinate technology and processes in order to provide the highest level of customer fulfillment and service, while at the same time managing multiple levels of external relationships. Establishing both the framework and content of such a robust level of channel synchronization requires deep commitment, trust, and the willingness and capacity to acquire and expand new skills.

Is it worth it? Yes, because this effort provides what Stewart Myers of MIT's Sloan School of Management calls “real options,” meaning “opportunities to make decisions in the future based on the outcome of things that are uncertain today.” Timely information gives companies in the supply chain real options to mitigate risks. For example, by having a real-time handle on demand pull, network trading partners can strategically plan and deploy safety stocks, determine the optimal point for product postponement, allocate capital, and minimize the impact of volume variances due to forecast error or demand fluctuations.

On the customer services side, real-time information enables companies to integrate customers directly into their business systems, thus increasing responsiveness, tracking order flow in real time and gathering channel-wide performance statistics. On the shop floor, real-time information improves planners' forward visibility into supplier capacities to smooth capacity spikes and improve throughput. In the supply channel, real-time information provides the bridge between company-level optimization planning and the global demand pull of the entire business network. In short, shared real-time information enables the generation of what one writer has described as "a portfolio of triggerable decisions with options to proceed or abandon by milestone." (Reary, Bob and Springer, Alicia, "Return on Relationship: A Different Lens on Business," in *Achieving Supply Chain Excellence Through Technology*, 3, Anderson, David L., ed. Montgomery Research, San Francisco, 2001, 41.)

Mechanism #6: Connectivity and Networking

Connectivity and networking are lean supply chain fundamentals. Connectivity presupposes the availability of a technical infrastructure that links computer systems and people. The word commonly used for this process is integration—a term often erroneously used as a synonym to connectivity and interfacing. To clarify:

Connectivity means connecting processes together, such as when a telephone system connects customers and order processing functions.

Interfacing means bringing information from one system and presenting it for input to another, such as occurs in an EDI transaction.

Organizationally, integration means leveraging information tools that bring business functions together by facilitating ever-closer coordination in the execution of joint business processes.

The integration effort focuses on activating the creative thinking within and between enterprises. It attempts to align the challenges and opportunities offered by information technologies and the cultures and capabilities of the modern organization.

The second fundamental technology dimension is networking—connecting different computers and their databases together in a peer-to-peer network. Targeted at solving the problem of dissimilar hardware operating systems, networked systems enable people to communicate directly both within the enterprise and across the entire value chain. Connectivity is the process of linking business functions together; networking activates those links.

Conclusion

We have defined lean SCM as a supply chain operational and strategic management philosophy that utilizes Internet-enabling technologies to effect the continuous regeneration of supplier and service partner networks. A lean supply chain network is empowered to execute superlative, unique customer-winning value at the lowest cost through the collaborative, real-time synchronization of product/service transfer, demand priorities, vital marketplace information, and logistics delivery capabilities.

Now that the basic elements of lean supply chain management have been defined and the enabling mechanisms identified, it is possible to detail the essential lean supply chain management processes. Our theoretical foundation is now in place. Stay tuned for the concluding paper in this "Lean is Fashionable" series, which outlines the action steps that will enable you and your partners to achieve inordinate customer service, efficiency and cost benefits.

Note: This is the second paper in the "Lean is Fashionable" series of thought leadership pieces from Lawson.

The first paper, "Lean Supply Chain Management in the Apparel Industry," discussed the real-world drivers of lean initiatives. It also looked at two companies whose practices and results can serve as benchmarks.

The third paper will provide a set of detailed action steps for moving to a lean supply chain.

Feel free to contact us at infous@lawson.com if you missed the first paper or want to sign up to receive the full series.

Meet the Authors

Robert McKee

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A 25-year veteran of the textile, apparel and sewn products industries, Bob McKee is the fashion industry strategy director for Lawson, a leading supplier of enterprise resource planning (ERP) software to the mid-market. He is responsible for software and solutions design, development and marketing for The Lawson US apparel business. He serves the company's apparel customers directly by providing counsel on reducing cycle times, forecasting demand planning, managing global production, and responding to industry changes.

Prior to his career in software, McKee spent many years in the apparel manufacturing industry where he held senior-level operations and sourcing positions for companies including O'Bryan Brothers, Holloway Sportswear, Bachrach Clothing, The Company Store, Warnaco and Hartmarx. During this time, he oversaw importing/exporting from over 30 countries, raw material and inventory management, inter-plant transportation, and production planning and scheduling. A member of AAFA and APICS, McKee frequently speaks at global supply chain and apparel industry events and has contributed to many leading publications.

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Learning Consultant for Lawson

Supply chain expert and published author David Ross, PhD is a learning consultant at Lawson, a leading supplier of enterprise resource planning (ERP) software to the mid-market. A seasoned executive with more than 30 years of industry experience, Dr. Ross heads the company's education and training program. He advises mid-market manufacturing, food and beverage, and apparel customers on how technology can provide a competitive advantage in today's complex, global supply chains.

Previously, Ross held senior operations management positions within the manufacturing and distribution industries at companies including McMaster-Carr Supply Company and Illinois Tool Works. He then focused on technology within the ERP industry, working with Computer Sciences Corporation, SSA and Epicor. Besides numerous articles, he has published three books on logistics and supply chain management. His first book, *Distribution Planning and Control* (2nd edition, Kluwer, 2004), is a cornerstone for the APICS Master Planning of Resources CPIM course. In addition, he has written *Competing Through Supply Chain Management* (Kluwer, 1998) and *Introduction to e_Supply Chain Management* (St. Lucie, 2003).

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